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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/827,352 | 04/20/2004 | Kousaku Matsuno | 251475US3DIV | 2616 |
| 22850 | 7590 | 01/11/2005 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | KORNAKOV, MICHAEL | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1746 | |

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/827,352 | Applicant(s) MATSUNO ET AL. | |
| | Examiner Michael Kornakov | Art Unit 1746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/742,423.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4/20/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 2, 21-23 are pending in the Application. Claim 1 is directed to a substrate treatment process, claims 21-23 are directed to substrate treatment apparatus. At this time no restriction has been made, however, if further amended, claims drawn to the process and apparatus, can be restricted during any phase of the prosecution.
2. Applicants are reminded that the continuity data of the instant Application should be updated.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recited "...that as viewed in plan, the liquid ejected from said nozzle unit reaches, with an area range having a length not smaller than a diameter of said substrate and a width smaller than said diameter of said substrate" is indefinite, because: a) in the claimed apparatus, the structural elements should be recited, no matter how they are viewed; b) the recited "liquid... reaches" is indefinite, because reaches what?; c) the recited "area range" is indefinite, because it is not clear what

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range is recited, if this is an area, it cannot be compared with the length, if this is the length of the bar, such should be stated.

Claim 23 is further rejected under 35 USC 112, second paragraph, as being indefinite, because it is not clear, which one of three flow channels of claim 23, i.e. ozonated water channel, hydrogenated water channel or ozone-hydrogen water channel is shielded from ultrasonic waves.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 2 is rejected under 35 U.S.C. 102(e) as being anticipated by Eui-Yeol (U.S. 6,035,871).

US'871 discloses a process for treatment a semiconductor substrate to remove the impurities adhering to the treated object 21 (Fig. 1) are in the form of particles and ***organic substances***, and that these particles and organic substances can be removed by performing spin cleaning (rotation cleaning) ***while both ozonized water and hydrogenated water are used as chemical fluids***. (see col.3, lines 58-65). Production of ozonated water and hydrogenated water is depicted in Fig.2, and comprises

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dissolving an ozone containing gas in the ultra-pure water and dissolving hydrogen containing gas in the ultra-pure water (see col.5, line 55 through col.6, line 22, col.7, lines 12-17). The cleaning can be conducted, for example by first applying the ozonated water and then applying the hydrogenated water (col.9, lines 37-39). Thus each and every element of claim 2 is disclosed by US'871.

7. Claims 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Eui-Yeol (U.S. 6,035,871).

US'871 discloses a substrate treatment apparatus comprising a **cleaning apparatus** (reads on treatment vessel) provided with a **cleaning room** 25 on Fig. 2 (reads chamber configured to enclose the apparatus in its entirety), in which there are **disposed a holder (22, Fig.2) for rotatably holding an object 21 to be treated, an ozonized water supply nozzle** 23 for supplying ozonated water to the treated object, **and a hydrogenated water supply nozzle** 24 for supplying hydrogenated water to the treated object (see col.2, lines 36-45). The solution is supplied to ozonated water supply nozzle and hydrogenated water supplied nozzle through a feed line configured to supply the cleaning solution to the respective nozzle (see Fig. 2 and 6 and col. 5, lines 20-27). With regard to a bar like structure of the nozzle, as recited in the instant claim 22, and as was previously rejected for its indefiniteness, the position 23 on Fig.2 presents a bar with the shower nozzles arranged along the bar. This corresponds to the drawing Fig. 2B presented in the instant specification. The length of the bar is larger than the diameter of a substrate, as can be seen from Fig. 2 of U.S. '871 (see positions 23 and 21). As can be also seen from Fig. 2, the width of this bar 23 is significantly smaller than

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the diameter of the substrate 21. Therefore, one skilled in the art can clearly envisage the nozzle unit in a form of the bar wherein the length of the bar is not smaller than the diameter of the substrate and the width of the bar is smaller than the diameter of the substrate. While the hydrogen water channel may be connected to ultrasonic device, as required by claim 22, the ozonated water channel is not connected i.e. shielded from ultrasonic waves, as required by the instant claim 23.

Thus all the structural elements of the claimed apparatus are disclosed by US'871.

8. Other prior art references cited in PTOL-892 show the treatment processes for semiconductor devices with the use of bar configuration nozzles.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Kornakov

Michael Kornakov
Primary Examiner
Art Unit 1746

01/07/2005